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NATIONAL FLOOD INSURANCE PROGRAM HANDBOOK

for
MISSOURI COMMUNITIES

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Disaster Planning and Operations Office
May 1979

VOLUME I EMERGENCY PROGRAM

**Developed Under the Auspices Of The
FEDERAL DISASTER ASSISTANCE ADMINISTRATION
Grant Number 7504 0114**

EXECUTIVE OFFICE
STATE OF MISSOURI
JEFFERSON CITY

JOSEPH P. TEASDALE
GOVERNOR

TO: Participating cities and counties in the Emergency
Phase of the National Flood Insurance Program

Major flooding continues to cause loss of life and property in Missouri. However, through the National Flood Insurance Program, many citizens can now insure their property against flood losses.

The problem of flooding will continue to cause a burden for many Missouri citizens until all new construction in floodplains is properly designed to minimize the flood risk.

The Missouri Disaster Planning and Operations Office has prepared a booklet to assist local officials in understanding and using flood hazard information. This booklet, entitled "National Flood Insurance Program Handbook for Missouri Communities", can be obtained from the Disaster Planning and Operations Office, Box 116, Jefferson City, Missouri 65102.

All communities are urged to implement local floodplain management for new development in floodplain areas.


GOVERNOR



DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
FEDERAL DISASTER ASSISTANCE ADMINISTRATION
FEDERAL BUILDING, 911 WALNUT
KANSAS CITY, MISSOURI 64106

REGION VII

IN REPLY REFER TO:

To: Recipients of the National Flood Insurance Program Handbook
for Missouri Communities

In Missouri, as in all of the United States, greater loss of life and property damage has resulted from flooding than all other natural disaster causes combined.

Since control of the weather is beyond the capability of man, we shall continue to experience flooding of varying magnitudes. However, limiting property damage and the loss of life is within the capability of individuals and units of government.

Proper construction practices where circumstances require the placement of facilities within known flood-hazard areas can minimize costly effects of high water flows. Individuals, political entities, and business organizations can indemnify themselves against crushing financial losses by participation in the federally subsidized National Flood Insurance Program. If your community is not participating in this program I urge that you take appropriate action to become eligible for the substantial benefits available.

I commend the State of Missouri for its continuing efforts to promote this worthwhile program.

Francis X. Tobin
Regional Director



DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
FEDERAL INSURANCE ADMINISTRATION
911 WALNUT STREET
KANSAS CITY, MISSOURI 64106

REGION VII

IN REPLY REFER TO:

To All Interested Parties:

In 1973 over ninety counties in Missouri were declared disaster areas by the President of the United States as a result of severe flooding. In the past, the loss of private and public property, and in some instances the loss of lives, has occurred in Missouri communities as the result of flooding. Flooding has, and continues to be, the greatest natural disaster.

Since floods are acts of Nature, but flood damages are a result of the acts of Man, future flood losses can be reduced if future development in floodplains is made in recognition of flood hazards. The enclosed Manual provides information for public officials, developers, and the general public to guide future development of Missouri's floodplains in a manner which will reduce future flood losses.

Flood damages are costly to the private and public sectors. Savings that are made as a result of the reduction of future flood losses will benefit homeowners, businessmen and local governments. We endorse the efforts of the State of Missouri to provide guidance to local governments, and we encourage the use of this Manual by homeowners, businessmen and local governments who wish to benefit from the important information that the Manual offers.

Sincerely,

A handwritten signature in cursive script, reading "Ben Stephenson", is written over a horizontal line.

Ben Stephenson
Federal Insurance and Hazard Mitigation
Federal Emergency Management Agency

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Editors Note:

Due to federal reorganization since the inception of this handbook the Federal Insurance Administration has been re-named. Consequently whenever the term Federal Insurance Administration or FIA appears we are referring to the new office of Federal Insurance and Hazard Mitigation, FEMA.

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I. INTRODUCTION

Purpose of the Handbook

This handbook is designed to assist communities and counties in understanding and using flood hazard information prepared by the Federal Insurance Administration. The handbook is written and illustrated in such a way as to clarify the regulations of the National Flood Insurance Program and simplify procedures that communities should follow in using the Emergency Program ordinance.

How to Use the Handbook

The text and illustrations in the handbook follow the sequence of the Emergency Program ordinance required of all communities participating in the National Flood Insurance Program. This handbook should only be used by communities participating in the Emergency Program.

Basic Concepts of the National Flood Insurance Program

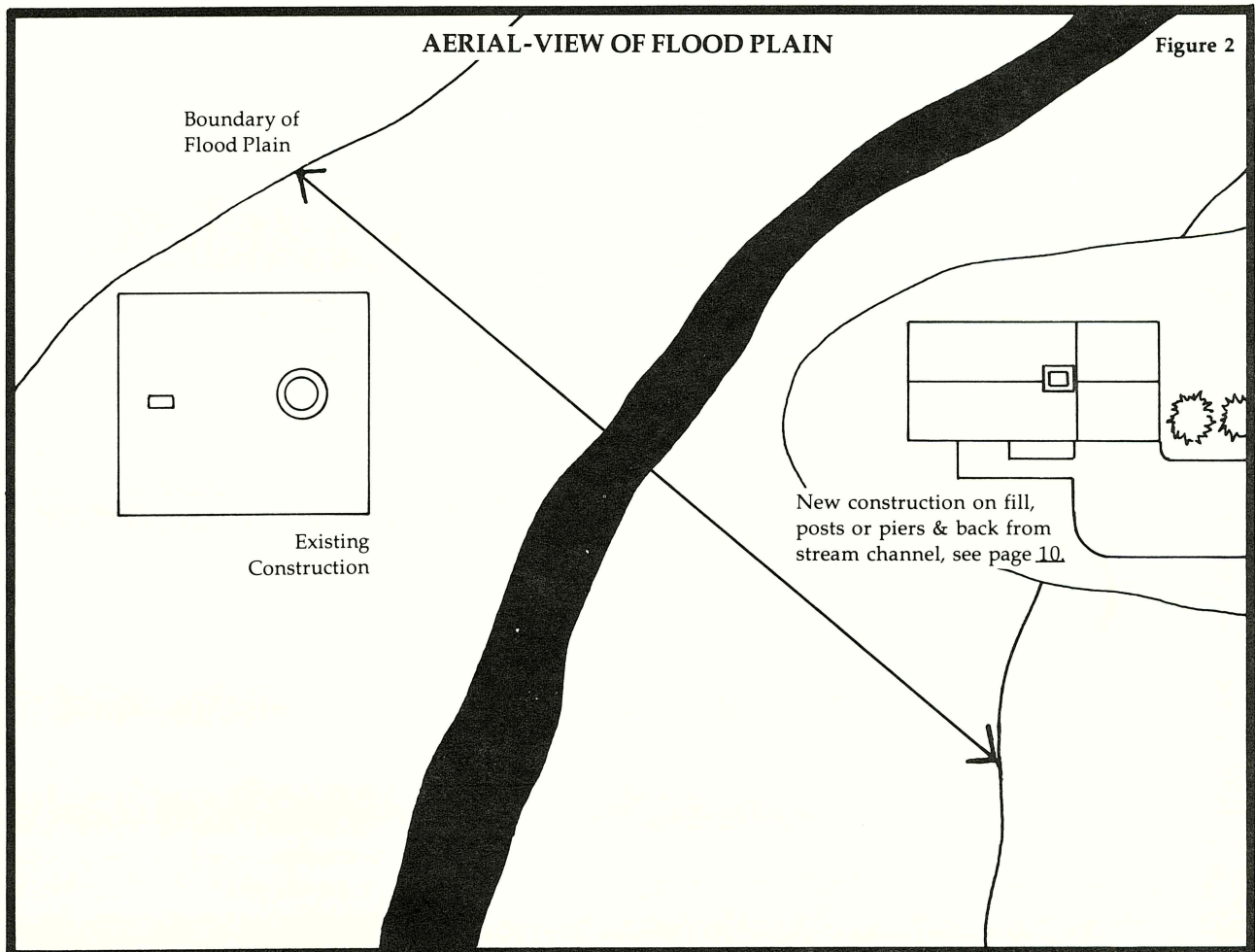
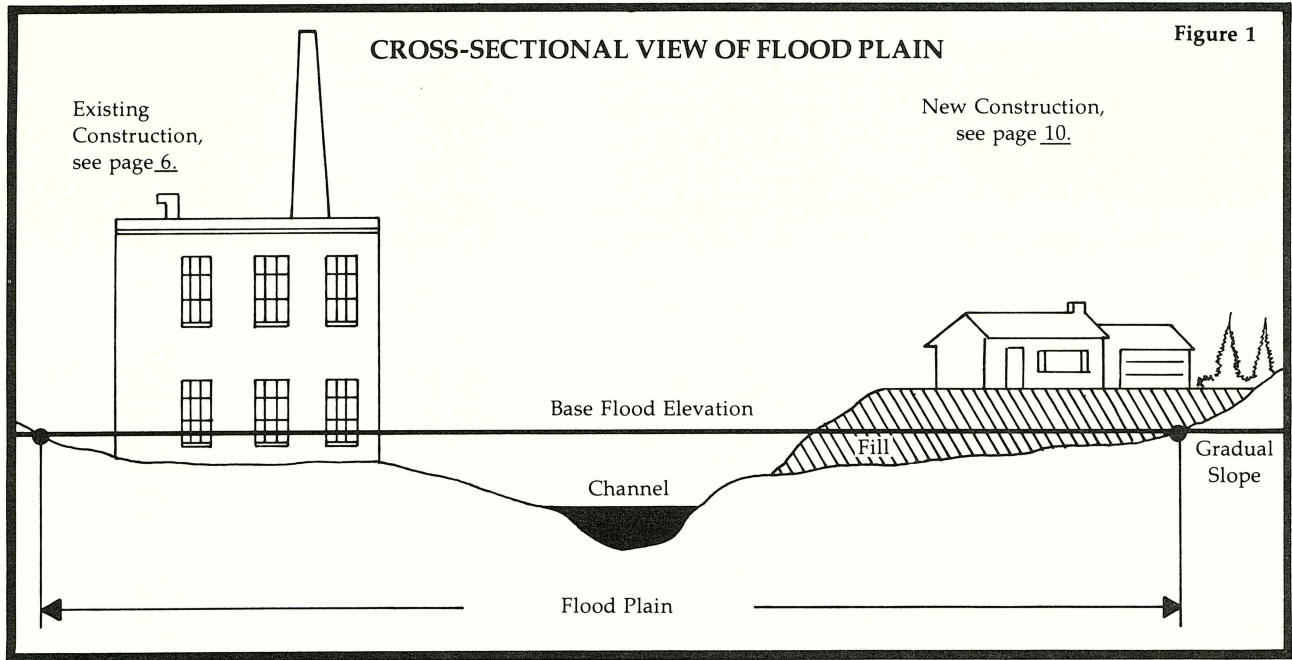
Brief History of the Program

The National Flood Insurance Program was enacted with the National Flood Insurance Act of 1968 which made federally-subsidized flood insurance available in communities that adopted regulations for future development in flood-prone areas. The Program was enacted in response to flood losses which approached \$1.25 billion annually. The long-range objective of the Program is to reduce the loss of lives and property while providing flood insurance at affordable rates for existing and new development. The combination of flood plain management and flood insurance will also substantially reduce the need for federal disaster assistance, thereby resulting in a savings to the taxpayer.

Basic Concepts of the Program

Flood plain management and flood insurance are the principal components of the National Flood Insurance Program. Flood plain management consists of policies, regulations and administrative procedures used by a community to minimize flood hazards. Flood insurance provides recovery from flood losses to real and personal property. Although this handbook primarily addresses flood plain management aspects of the National Flood Insurance Program, there are basic concepts involving flood plain management *and* flood insurance which must be understood before a general understanding of the National Flood Insurance Program can be attained. These basic concepts are the subject of the remainder of this chapter.

1. **Flooding.** Flooding is defined for the purposes of the National Flood Insurance Program as a temporary rise in stream flow resulting in the inundation of adjacent land, or the sudden and unusual accumulation of runoff also resulting in the inundation of land. The presence of large bodies of water such as the Mississippi, Missouri or Meramec Rivers is not a prerequisite for flooding. Instead, flooding can occur as ponding, dam failure, or flash flooding of creeks and ditches, as well as the gradual rise of waters from large rivers.
2. **The Base Flood.** The 100-year flood, hereafter referred to as the Base Flood, is a measure of flooding of a certain magnitude used as a standard in the United States. The Base Flood has a one-percent chance of occurrence in any given year.
3. **The Flood Plain.** Areas inundated by floodwaters constitute the flood plain of the river, creek, ditch or other source of flooding. For the purposes of this handbook, the floodplain refers to the area that would be inundated by the Base Flood. The flood plain is also referred to as the Special Flood Hazard Area.



4. **The Base Flood Elevation.** The level of flooding that is reached in the occurrence of the Base Flood is referred to as the Base Flood Elevation (BFE). The elevation of the water surface is referenced to Mean Sea Level (MSL). For example, a Base Flood Elevation of 928 FT refers to a water surface elevation of 928 feet above MSL. Elevations of undeveloped land, or of residential and commercial buildings is also referenced to MSL, therefore, if a survey of the lowest floor of a residence produces an elevation of 925 FT MSL, and the Base Flood Elevation is 928 FT MSL, the residence is exposed to a flood hazard of three feet of water during the occurrence of the Base Flood.
5. **Encroachment.** Development of flood plains results in the restriction of natural overflow areas that are claimed by streams during flooding conditions. Each development encroaches on the natural overflow area of the stream or other source of flooding and increases the Base Flood Elevation. Development of flood plains is consequently entitled "encroachment."

These basic concepts of the National Flood Insurance Program are referred to throughout the remainder of this handbook. These concepts are illustrated in Figures One and Two.

The Emergency Program

A community's participation in the National Flood Insurance Program occurs in two phases. The first phase, called the Emergency Program, exists from the time that a community makes application and adopts a resolution or ordinance until the completion of a Flood Insurance Study. After a Flood Insurance Study has been completed, a community becomes eligible for participation in the Regular Program.

II. THE FLOOD HAZARD BOUNDARY MAP

Purpose of the Map

Flood hazard areas of all communities in the United States are identified by the Federal Insurance Administration. Notice of identification of flood hazard areas is given to a community by means of a letter and a map. The letter, addressed to the Mayor or other community officials, explains that flood hazard areas within the community have been identified by the Federal Insurance Administration. The map, called the Flood Hazard Boundary Map shows the boundary of the flood hazard area within the community.

Flood hazard areas are sections of a community that will be inundated by the Base Flood, which is a standard used for all communities in the United States. The Base Flood has a one per-

cent (1%) chance of occurrence each year. For the homeowner who purchases a 30-year mortgage in the flood hazard area there is a 25% possibility that his home will be damaged by the Base Flood before he repays the mortgage loan.

The Flood Hazard Boundary Map, therefore, provides notice to community leaders, developers, mortgage lenders, businessmen and homeowners that flood hazard areas exist within a particular community. A community's participation in the National Flood Insurance Program is an effective method of reducing flood hazards, and the community relies on its flood plain management ordinance and Flood Hazard Boundary Map to attain that goal.

How to Use the Flood Hazard Boundary Map

An example of a Flood Hazard Boundary Map is shown in Figure Three. The community number, 290216A, is located on the first page of the map, and should be used when ordering additional maps. The effective date of the map and

the date of subsequent map revisions is also given on the first page. In the example, the map was first published on January 9, 1974, and was revised on April 16, 1976.

The flood hazard area is shown in a shaded

pattern on the reverse side of the map. The flood hazard area is also known as Zone A for flood insurance rating purposes. If the hazard area was added to the map as a result of a map revision, the date of the revision is shown on the map. For example, the map revision of April 16, 1976 added the flood hazard area in the northern part of the communities as shown in Figure Four.

A map scale is located at the bottom of the map. This scale is used to determine if a particu-

lar site is in the flood hazard area. For example, when the scale is applied to the map in Figure Four in the vicinity of Rte. 170 and Atkins Drive, it can be determined that the flood hazard area extends 6/16 of an inch (400 ft.) from the center of the creek to Rte. 170. It can also be determined that the flood hazard area begins 3/16 of an inch (200 ft.) from Rte. 170. As another example, it can be determined that the flood hazard area begins 6/16 of an inch (400 ft.) from the intersection of Atkins Drive and Fair Street.

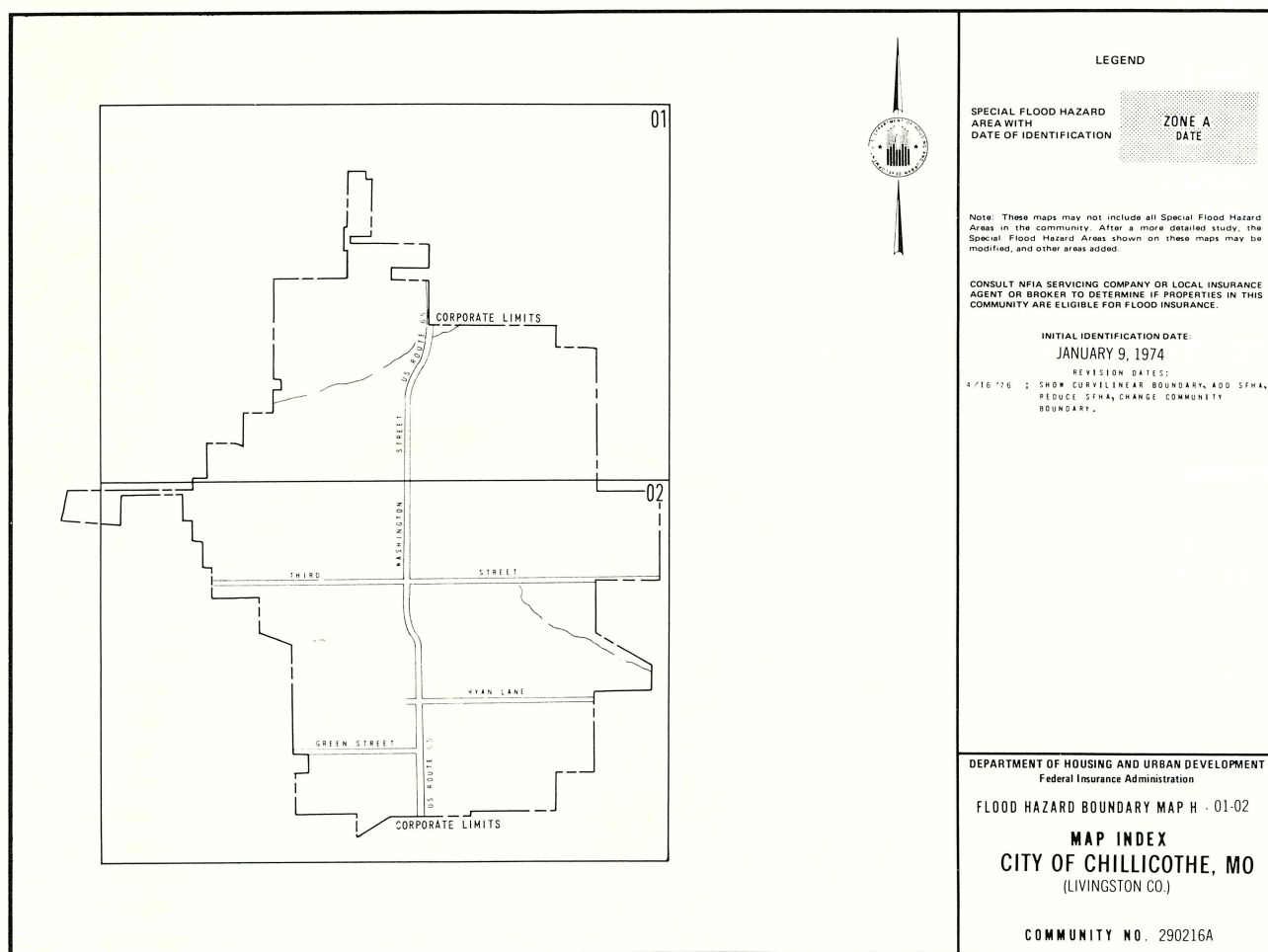


Figure 3

Flood Plain Determinations

Determinations as to whether property is located in the flood hazard area of a community are made for two reasons: (1) for flood plain management purposes, and (2) for mortgage lending purposes.

For flood plain management purposes, the community's code enforcement officer must

determine whether a piece of property is located in the flood hazard area. If it is, the enforcement officer applies the requirements of the Emergency Program ordinance to any proposed development of the property. It is therefore the responsibility of the community government to determine whether property is located in the flood

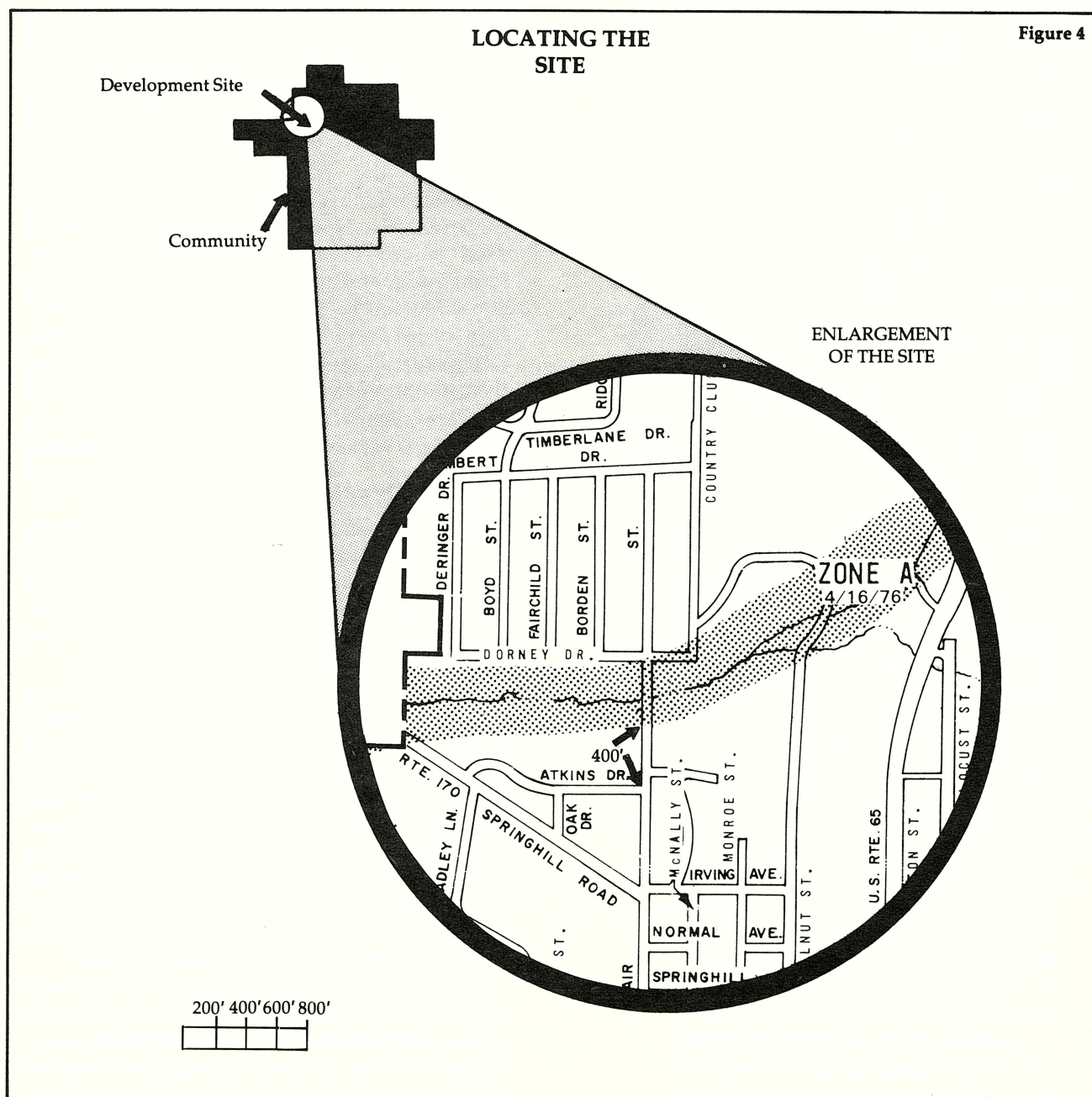
hazard area, when the purpose of the determination concerns flood plain management.

For mortgage lending purposes, banks, savings and other lending institutions regulated or insured by the Federal Government must determine whether a piece of property is located in the flood hazard area. If it is, the lender must require that flood insurance be acquired by the mortgage to cover the amount of the loan on insurable structures or proposed insurable structures.

It is therefore the responsibility of the mortgage lending institution to determine

whether property is located in the flood hazard area. If it is, the lender must require that flood insurance be acquired by the mortgage to cover the amount of the loan on insurable structures or proposed insurable structures.

It is therefore the responsibility of the mortgage lending institution to determine whether property is located in the flood hazard area, when the purpose of the determination concerns mortgage loans. The final determination *can not be delegated to the community government or any other party* when determinations are made for mortgage lending purposes.



Appeals to the Flood Hazard Boundary Map

Property owners may appeal their property being shown within the flood hazard area on a community's Flood Hazard Boundary Map. If the appeal is successful, a letter of Map Amendment will be sent to the property owner and the community government.

Information required as a basis for an appeal is as follows:

1. Legal description of the property, usually an actual copy of the recorded plat map bearing the seal of the circuit clerk (County Clerk or Recorder of Deeds), indicating official recordation and proper citation (Deed or Plat Book Volume and Page Numbers).
2. A topographical map which shows: ground elevation contours, the total area of the property in question, the location of the structure or structures on the property in question and an indication of the curvilinear line which represents the area subject to inundation by a flood having a 1-percent chance of occurrence in any given year. This curvilinear line must be based upon information provided by an authoritative source, such as the U.S. Army Corps of Engineers, USGS, SCS, or other Federal agency, the State Department of Water Resources, the County Water Control District, the County or City Engineer, a FIA Flood Insurance Study, or technical data prepared by a registered engineer. FIA may coordinate information submitted by a property owner with any of the above listed sources.
3. A certification by a registered professional engineer or licensed land surveyor stating (1) the type of structure, (2) whether or not it is elevated on posts, piers, or walls (3) whether it is built on a barrier sand dune, (4) the elevation of lowest floor (including basement), and (5) the elevation of the lowest grade adjacent to the structure.

Letters of request and information supporting requests for a Letter of Map Amendment should be sent directly to:

Chief, Cartographic and Map
Amendments Branch
Federal Insurance and Hazard Mitigation
FEMA
Room 5144
415 - 7th Street, S.W.
Washington, D.C. 20410

III. THE EMERGENCY PROGRAM ORDINANCE

The most important aspect of a community's participation in the Emergency Program is the use of the flood plain management resolution or ordinance. The ordinance specifies measures which must be taken to reduce flood hazards. Generally, the ordinance requires that *new* development must be built above the Base Flood elevation. The Flood Hazard Boundary Map is used to determine the location of the flood hazard area, and any available flood information is used to set the elevation requirement.

In order to clarify the requirements of the Emergency Program ordinance, each section of the ordinance is explained and illustrated in the following pages.

Issuing Development Permits

Separate permits are required when erecting, constructing, enlarging (over 50% of market value) or building a structure; placing a mobile home; or mining, dredging, filling, grading, paving, excavating or drilling within the flood hazard area.

Maintenance work such as roofing, painting, and basement sealing does not need a permit. Small development activities (except for filling) valued at less than \$500 do not need permits. For improvement projects that cost more than \$500 but less than 50% of the building's value, a permit can be granted without requiring the project to comply with the ordinance. All filling projects and all other development activities valued at over \$500 must have a permit and must comply with the ordinance.

Development permits are issued by the community's flood plain management enforcement officer, and records of the permits must be maintained by him. A sample development permit can be found in the Appendix of this handbook.

In order to obtain a permit, the developer must provide information to demonstrate that the development will be safe from flooding and will not increase flood hazards. Plans for small developments such as individual residences or businesses, must include the property description, location of structures, elevation of the first floor and basement, and location of the flood hazard area. Plans for larger developments must be accompanied by more detailed information, such as the location of structures, elevation of the first floor and basement of each building, drainage plan, utilities plan, grading plan, and location and Base Flood elevation. If the Base Flood elevation is not available, the developer must provide one.

Plans for stream channel modifications, filling, dredging, or excavation must include the 100-year flood elevation before and after the project is built. The 100-year flood elevation must not be increased more than one-foot as a result of the project being built.

Reviewing Development Permits

Development permits are reviewed by the community's enforcement officer, planning and zoning committee, City Council, or other person or committee that normally reviews building permits. Review of permits involves the following steps:

1. Determine whether the development site is safe from flooding.
If the development is small, the person or committee reviewing the permit can use existing information on flood hazards to determine whether the site is safe from flooding. This information includes published reports, news articles, high water marks, or locally-known levels of past floods. The reviewing agency should require additional information, if needed, to make a determination that the site is reasonably safe from flooding.

2. Require that any additional local, state or Federal permits are obtained, if applicable.

Other than the flood plain development permit, additional local, state and Federal permits may be required in order to

develop a particular site. These permits include:

Corps of Engineers — Section 404 Permit for discharging dredged or filled material into rivers and adjacent wetlands. Section 10 Permit for construction activities that may affect a Corps of Engineers flood protection project.

Missouri Department of Natural Resources — National Pollutant Discharge Elimination System Permit for discharging wastes into streams.

Metropolitan Sewer District (St. Louis Area) — The MSD should be contacted prior to the alteration of watercourses, or construction in or near watercourses under its jurisdiction.

Levee and Drainage Districts — Levee and drainage districts should be contacted prior to the construction or alteration of levees, dikes or drainage-works within their jurisdiction.

Adjacent Communities — Although no permit is required from them, adjacent communities should be contacted prior to the planned improvement or alteration of streams and watercourses.

Obtaining and Using Flood Elevation Data

SOURCES OF DATA

Emergency Program communities are provided Flood Hazard Boundary Maps which, as previously mentioned, show the boundary of the 100-year flood plain. Flood elevations are not provided on these maps. Emergency Program ordinances require that new development be protected from the 100-year flood elevation, therefore the community's enforcement officer must rely on various sources of flood information, including:

1. High water marks on buildings, telephone poles, fire hydrants, bridges or other structures.
2. Published reports, such as U.S. Geological Survey flood-prone area maps, and U.S. Army Corps of Engineers flood plain information reports.

3. News articles and photographs showing past floods in the community.

SOURCES OF ASSISTANCE

Federal and state agencies may be able to assist communities needing flood elevation information. These agencies are:

1. Federal Insurance Administration
2. U.S. Army Corps of Engineers
3. U.S. Geological Survey
4. Soil Conservation Service

OTHER SOURCES

As previously mentioned, for larger developments consisting of 5 acres or more, developers should provide the 100-year flood elevation and include the information in the site plan. Private engineering firms can be contracted to produce the 100-year flood elevation for these types of developments.

Requirements for Residential Structures

GENERAL REQUIREMENTS

Generally, the Emergency Program ordinance specifies that new residences (built after the date of the ordinance) must be elevated above the Base Flood elevation. This means that the first floor, including the basement if there is one, must be located above the Base Flood elevation. In order to do this, the enforcement officer must determine what the first floor will be, and then establish the elevation requirement. It is then up to the developer to decide which method of elevating the residence will be used.

DETERMINING THE FIRST FLOOR

Flood insurance rates are based in part on the first floor level of a structure. If the first floor level is equal to the 100-year flood elevation, then each year there is a 1% chance of flood loss to the first floor. There is a greater probability of loss if the structure has a basement. For new construction it is therefore very important that the first floor level be at least equal to the 100-year flood elevation. Listed below are several examples of first floor levels of various types of residences. These examples are illustrated on page 9.

1. One-story without a basement — the first floor level is the top of the finished floor. As an added precaution, the bottom of the floor joists could be used as the first floor level.

2. Two-story building without a basement — the first floor level is determined in the same way as a one-story building without a basement.
3. One-story with a basement — the first floor level is the basement floor.
4. Split-level without a basement — the first floor level is the lowest floor of the structure.
5. Split-level with a basement — the first floor level is the basement floor.
6. Two or more stories with a basement — the first floor level is the basement floor.

ESTABLISHING THE MINIMUM ELEVATION REQUIREMENT

Once the first floor level has been determined the enforcement officer can then inform the developer in writing which level of the residence must be elevated to the Base Flood elevation. The enforcement officer would use the Base Flood elevation, if available, or any other flood elevation that is available, in setting this requirement.

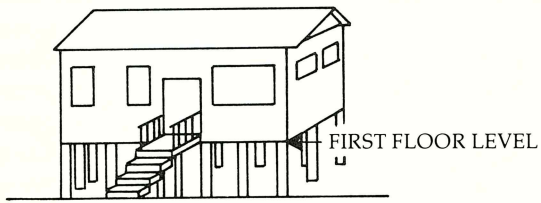
METHODS OF ELEVATING RESIDENTIAL STRUCTURES

Residences can be elevated by increasing the height of the foundation, adding fill, or constructing the residence on posts or piers. These methods are described in more detail below, and are illustrated on the following pages.

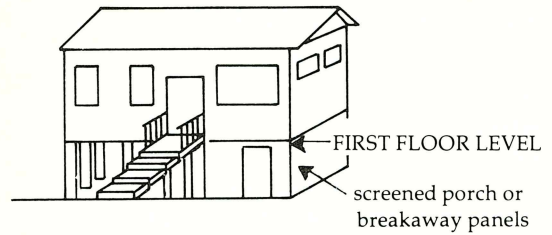
1. **Increasing the height of the foundation** — It is a common practice in many Missouri communities, especially in Southeast Missouri, to construct residential foundations using 8x8x16 inch concrete blocks. Foundations are therefore described as being "two-blocks high", "three-blocks high", and so on. Using this as a gauge, a developer could use a three-block high foundation to meet a two-foot elevation requirement. Likewise, a five-block high foundation could be used to meet a three-foot elevation requirement. The same technique could be used when pouring a concrete foundation and having a crawl space beneath a residence. As previously mentioned, the floor

DETERMINING THE FIRST FLOOR LEVEL

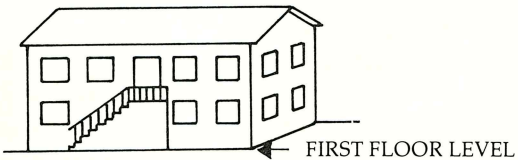
ONE STORY NO BASEMENT
(elevated structure)



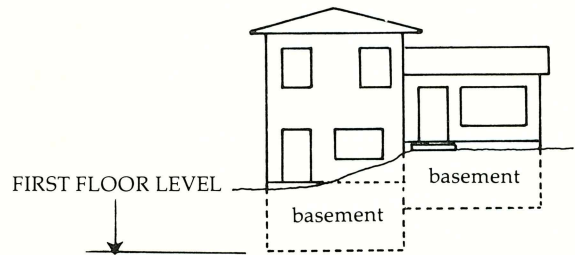
ONE STORY NO BASEMENT
(elevated structure)



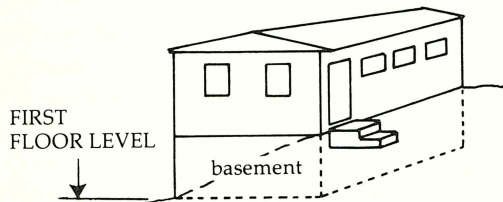
TWO OR MORE STORIES NO BASEMENT



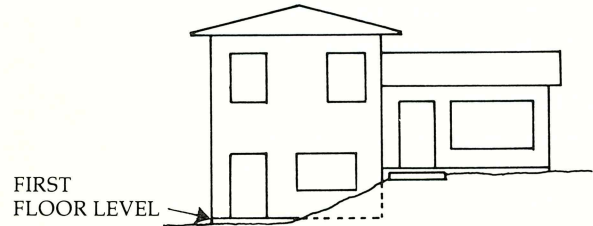
SPLIT LEVEL W/BASEMENT



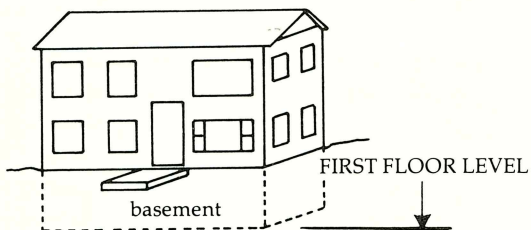
ONE STORY W/BASEMENT



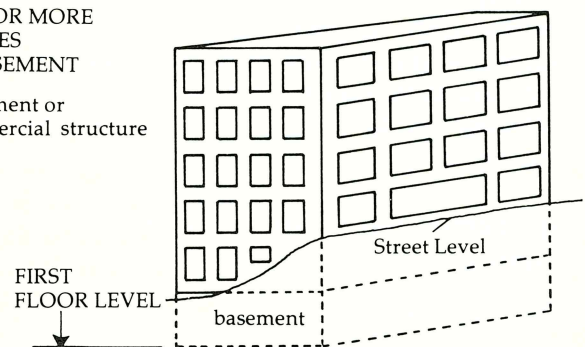
SPLIT LEVEL NO BASEMENT



TWO OR MORE STORIES W/BASEMENT



TWO OR MORE STORIES
W/BASEMENT
Apartment or
Commercial structure



TWO OR MORE STORIES NO BASEMENT
(elevated structure)

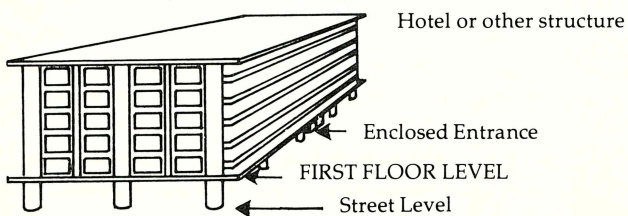


Figure 5

joists could also be used to meet the elevation requirement, therefore a four-foot elevation requirement could be met by using five blocks and a 10-inch floor joist. By using these techniques, the foundation can therefore be designed to provide protection of the first floor level from the Base Flood.

2. **Using earth fill** — Fill dirt may also be used to meet the elevation requirement for residences. Fill may, of course, be used in combination with the foundation to meet the elevation requirement. Fill should extend 15 feet from all sides of the structure so as to increase the stability of the fill during floods.
3. **Using posts or piers** — Elevation requirements may also be attained by the use of posts or piers as structural supports. This method of elevating residential structures is common in areas adjacent to the Missouri, Mississippi and Meramec Rivers where elevation requirements may exceed 10 feet.

CERTIFICATION

It must be certified by a licensed surveyor or engineer that the elevation requirement has been met. Certification requirements are explained in more detail later in this handbook. Sample certification forms are provided in the Appendix of the handbook.

Additional information about elevating residential structures may be obtained by ordering the *Elevated Residential Structures* manual listed in the Appendix.

Requirements for Commercial Structures

GENERAL REQUIREMENTS

Generally, the requirements of the Emergency Program ordinance concerning commercial (non-residential) structures are not different than those of residential structures. That is, the enforcement officer must determine the first floor level and establish the Base Flood elevation, and the developer must design the structure to meet the elevation requirement. For information regarding these procedures, refer to the preceding section on residential structures.

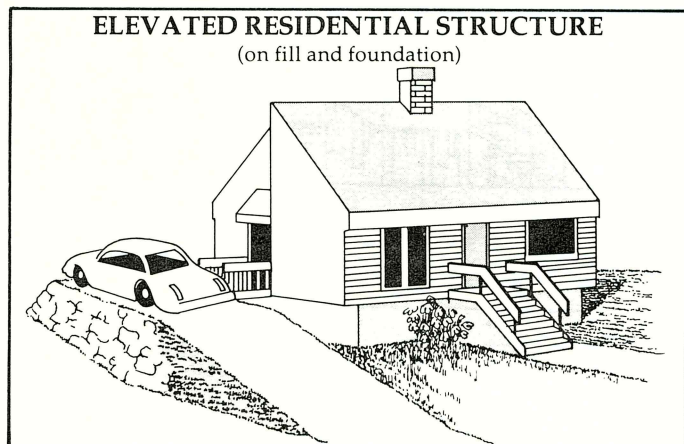


Figure 6

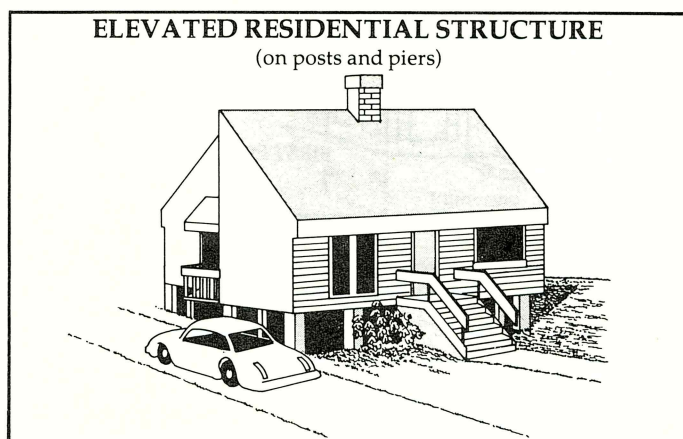


Figure 7

FLOODPROOFING COMMERCIAL STRUCTURES

Non-residential structures have the option of floodproofing to provide protection from the Base Flood. Floodproofing consists of designing a structure in such a way that all parts of the structure located below the 100-year flood elevation are water-tight and resistant to flood damage. Approved floodproofing methods include dry floodproofing and human intervention. These methods are described in detail below and illustrated in Figure Eight.

1. **Dry Floodproofing** — Dry floodproofing consists of the actual design of a structure to provide protection from the Base Flood. The structure must be designed to prevent seepage, collapse or cracking of basement walls, buckling of basement floors and back-up of water from sewer lines. Walls must be capable of withstanding hydrostatic pressure and all openings must be located *one-foot above* the Base Flood Elevation. Waterproof seals and paints should be used on exterior surfaces exposed to the Base Flood. These techniques are illustrated in Figure Eight. Additional information concerning floodproofing techniques may be obtained by ordering the *Introduction to Floodproofing* manual listed in the Appendix to this handbook.
2. **Human Intervention** — Human intervention involves the use of door and window shields as temporary protection from the Base Flood. Door and window shields may be made of wood, metal or other materials, but must be designed to be secured in place to cover all openings exposed to the Base Flood. This method should be used *only* where adequate flood warning time or devices are present. Shields and other temporary floodproofing devices should be stored near the opening, and employees should be familiar with their location and use.

CERTIFICATION

All floodproofing techniques must be certified by an engineer or architect to provide the

specified protection from flooding. Certification requirements are explained in more detail later in this handbook, and sample certification forms are provided in the Appendix.

Requirements for Construction Materials, Methods and Equipment

GENERAL REQUIREMENTS

The Emergency Program ordinance specifies that construction materials, equipment and methods must minimize flooding. Specifically, the following objectives should be met:

1. Materials and Equipment

Wood floorings shall be installed to accommodate a lateral expansion of the flooring, perpendicular to the flooring grain without incurring structural damage to the building.

All finished flooring shall be made of materials which are stable and resistant to water damage resulting from submersion.

All carpeting or carpet cushions employed as a finished flooring surface shall be made of materials which are resistant to water damage resulting from submersion.

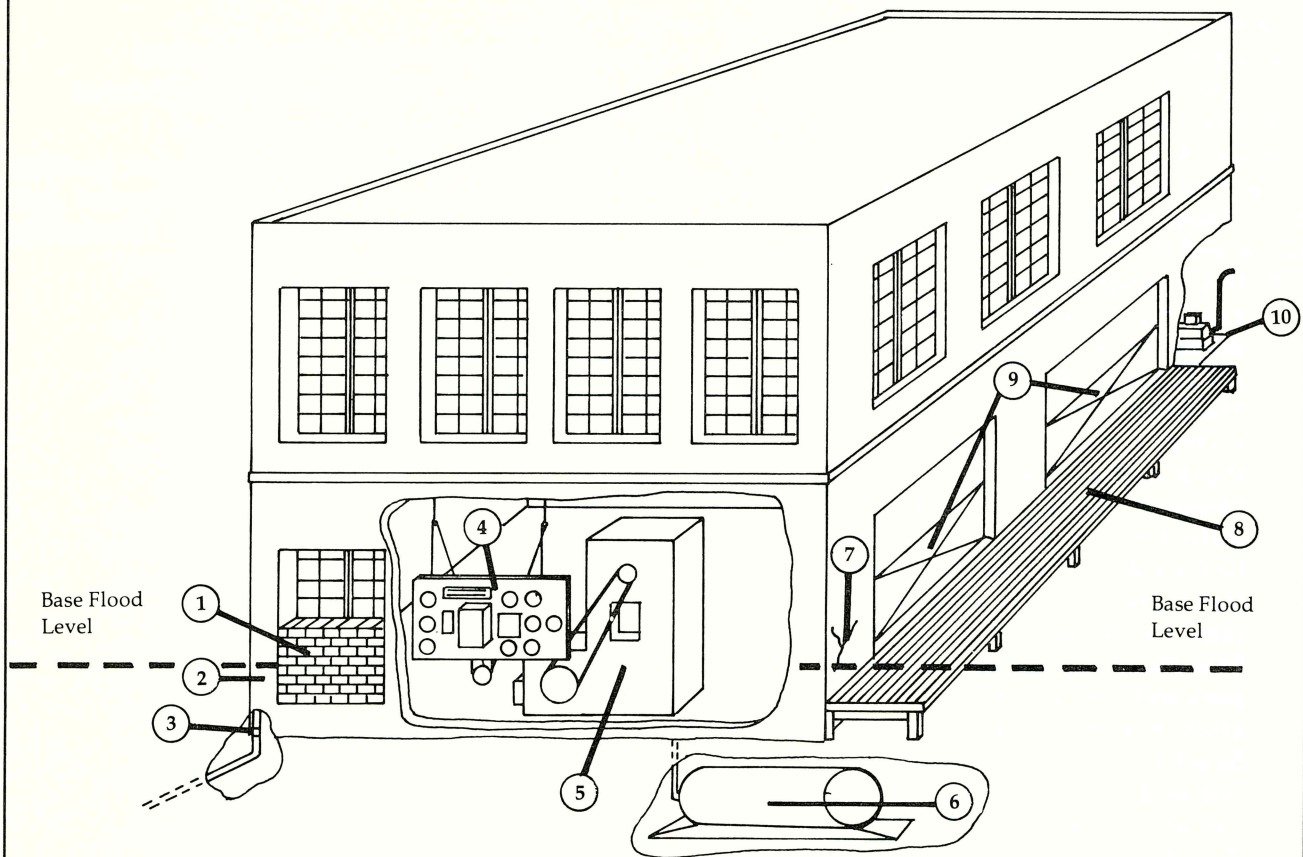
Plywood shall be made of an "exterior" or "marine" grade and of water-resistant or water-proof variety.

2. **Construction Methods** — Construction methods can be adjusted to reduce flood hazards in the flood plain. Generally, all of the requirements of the Emergency Program ordinance constitute construction methods designed to reduce flood hazards. There are, in addition, two specific construction techniques which can be employed to reduce flood hazards to new construction in the floodplain. These techniques are: (1) building setback, and (2) building alignment.

Building Setback — Building setback involves the placement of fill, posts or pilings at least 50 feet from the central portion of the creek, ditch or other source of flooding. Property located within 50 feet of the source of flooding can be used

FLOODPROOFED COMMERCIAL STRUCTURE

Figure 8

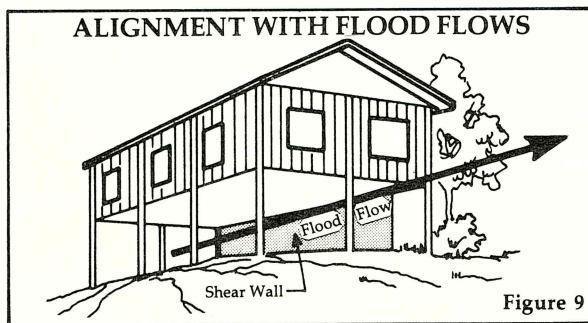


EXPLANATION

1. Permanent closure of opening with masonry
2. Thoroseal coating to reduce seepage
3. Valve on sewer line
4. Utilities raised above base flood level
5. Machinery protected with polyethylene covering
6. Underground storage tank properly anchored
7. Cracks sealed with hydraulic cement
8. Elevated loading dock
9. Steel bulkheads for doorways
10. Sump pump and drain to eject seepage

for access, parking, recreation, or other non-structural uses which will not impede flood waters or increase the Base Flood Elevation. The setback technique provides assurance that a minimum section of the floodplain will remain free of obstruction.

Building Alignment — Building alignment involves the placement of structures in such a way as to offer the least obstruction to flood flows. Buildings that are aligned horizontal to flood flows or stream flows will accomplish this objective. The alignment technique is shown in Figure Nine.



Anchoring Requirements

New structures located in the flood hazard area must be anchored to prevent their collapse, flotation or lateral movement. It is, of course, a standard construction procedure to anchor a residential or commercial structure to its foundation. The need to anchor other structures such as sheds, detached garages, mobile homes and liquid storage tanks may not be as obvious, however, it must be addressed when such structures are located in flood-prone areas. Details concerning anchoring are given below. Mobile home anchoring requirements are discussed in detail in the mobile home section of this handbook.

Anchoring Sheds, Detached Garages and Other Accessory Buildings

Methods of anchoring larger buildings may also be applied to smaller ones. Sheds, detached garages and accessory buildings may be bolted to their foundations to meet the anchoring requirement.

Anchoring Liquid Storage Tanks

Liquid storage tanks can be anchored with straps or they can, if practical, be elevated above the Base Flood Elevation.

Utility Requirements

Electrical and plumbing facilities must be designed and located so as to minimize flood damage. This can be accomplished by using the techniques described below and illustrated in Figure Ten.

ELECTRICAL SYSTEMS

All electrical water heaters, electric furnaces, and other critical electrical installations must be located above the Base Flood elevation.

PLUMBING

Water heaters, furnaces, and other critical mechanical installations shall be prohibited below an elevation of one (1) foot above the established Base Flood elevation.

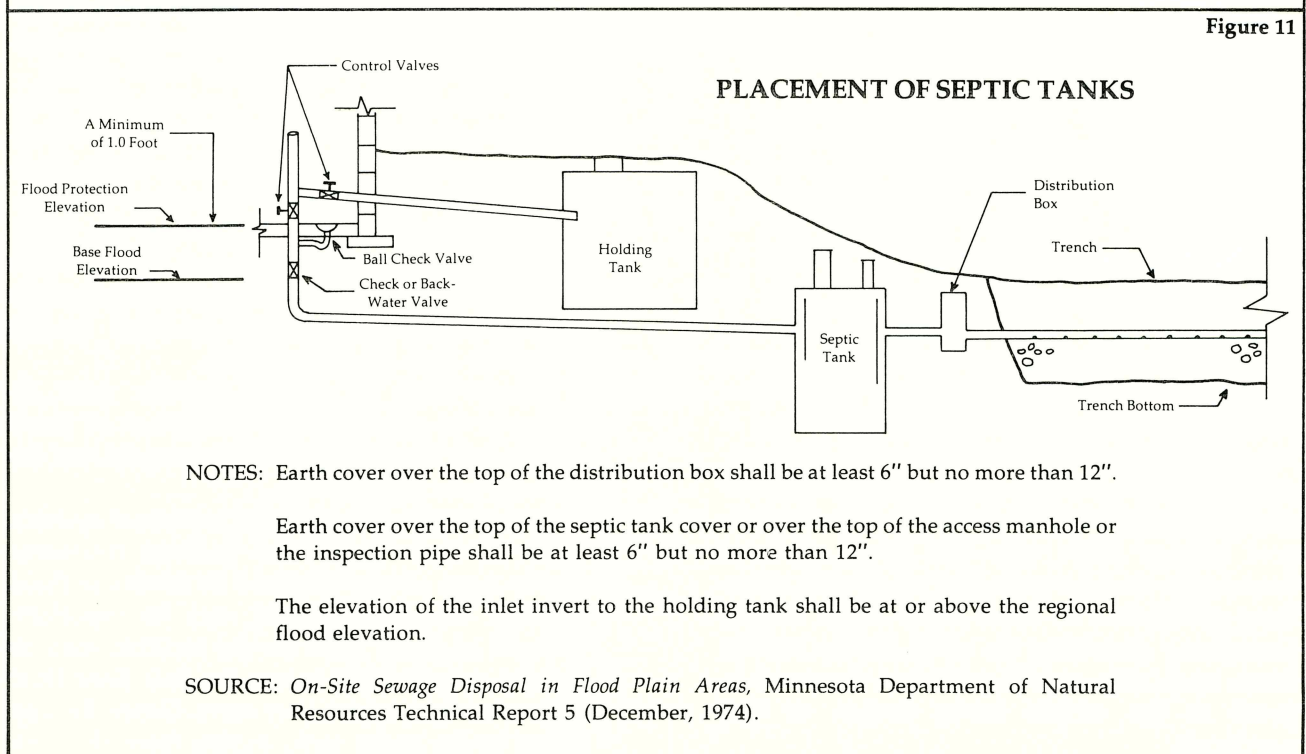
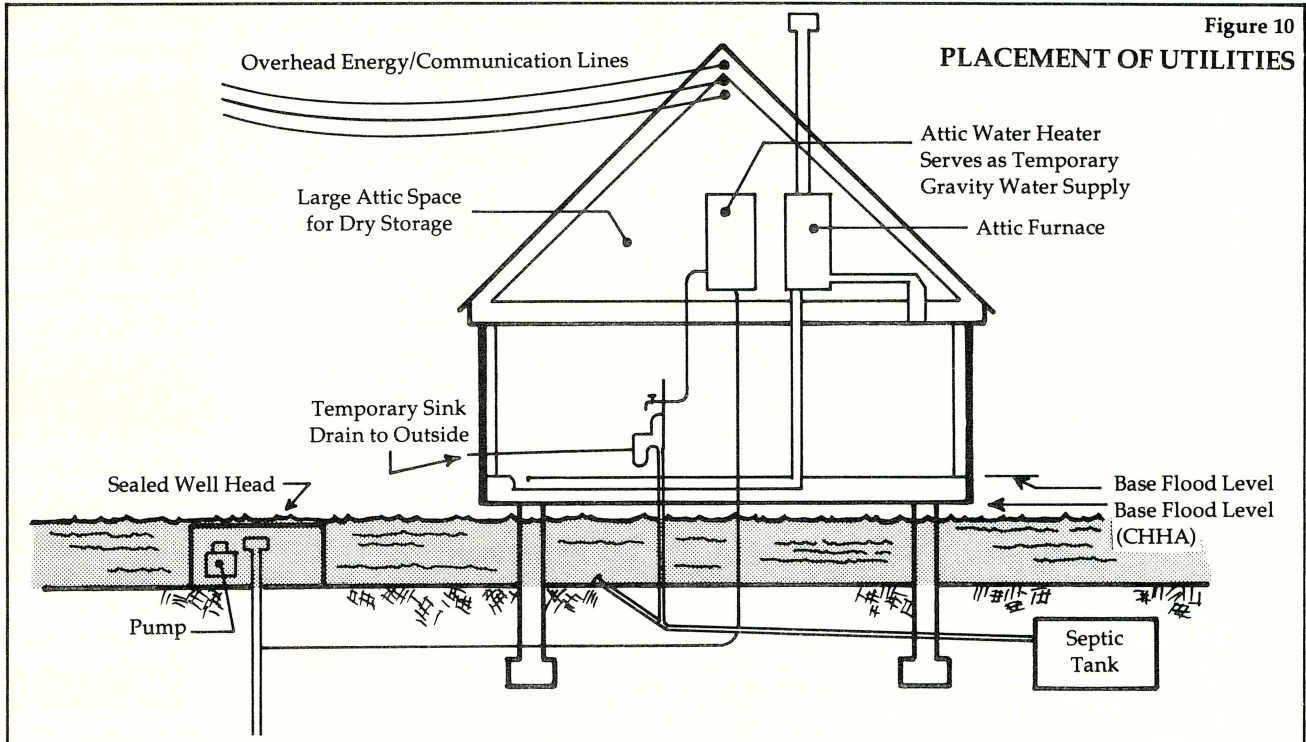
Water supply systems, wells and sanitary sewage systems must be designed to preclude infiltration of flood waters into the systems and discharges from the system into flood water.

Manhole covers must be located above the "100-year flood" elevation or otherwise designed to minimize flood damage. Waste treatment facilities, including pumping stations, lagoons and treatment plants must be flood-proofed or otherwise protected to the Base Flood elevation. Ring levees may have to be used to protect waste treatment facilities located below the Base Flood elevation.

All gas and oil supply systems must be designed to preclude the infiltration of flood waters into the systems and discharges from the systems into flood waters.

On-site waste disposal and treatment systems such as septic tanks and package treatment plants must also be designed to minimize flood damage. This requirement may be especially difficult to attain since on-site facilities may be located substantially below the first floor level of the structure which they serve. Generally, any inlets to the septic tank, outlets from the tank

and trenches providing waste disposal should be located above the Base Flood, if practical. A mound system of waste disposal may have to be used to provide adequate subsurface drainage during occurrences of flooding. Basic design and layout of onsite systems are shown in Figure Eleven.



Mobile Home Requirements

Mobile homes generally are more susceptible to flood damage than conventional homes and businesses, mainly because of the likelihood that they will be dislodged from their foundations, collapse or move laterally during serious flooding. Flood damage prevention requirements for mobile homes are therefore given extensive consideration in the Emergency Program ordinance.

GENERAL REQUIREMENTS

In several instances, mobile homes are treated differently than other structures when applying flood plain regulations, namely:

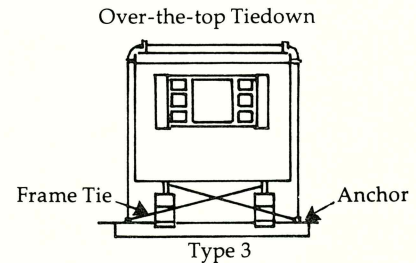
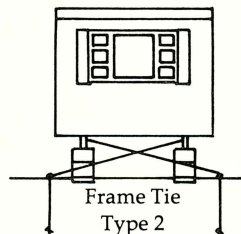
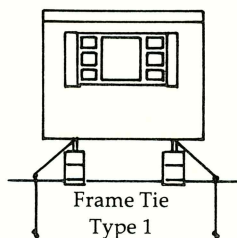
1. The mobile home *pad* is "grandfathered-in" for flood plain management purposes. This means that mobile homes located on pads that existed prior to the adoption of the Emergency program ordinance are not subject to the mobile home requirements. Pads are defined as concrete or gravel parking spaces with attendant utility hook-ups. Anchoring requirements are an ex-

ception since, by state law, all mobile homes must be anchored.

2. Mobile home parks or subdivisions are "grandfathered-in" as a single unit. Expansions of mobile home parks or subdivisions after the effective date or the "Emergency Program ordinance" are subject to the regulations.
3. Mobile homes may be anchored by using over-the-top ties or straps. The anchoring system must be capable of carrying a force of 4,800 pounds. An anchoring system designed to withstand a wind force of 90 miles per hour meets this requirement.

Over-the-top ties should be provided at each of the four corners of the mobile home, with additional ties on each side if the mobile home exceeds 50 feet in length. If a mobile home is elevated on a foundation, posts or piers it must be anchored. If the mobile home is elevated on fill above the "100-year flood" elevation, anchoring is encouraged, but not required, for flood protection purposes. Methods of anchoring mobile homes are shown below.

MOBILE HOME ANCHORING SYSTEMS



These sketches illustrate various methods for connecting frame ties to the mobile home frame. Type 2 system can resist greater horizontal forces than Type 1. Type 3 system involves placement of mobile home on concrete slab. Anchors embedded in concrete slab are connected to ties.

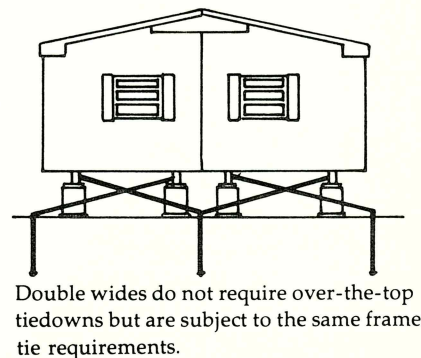
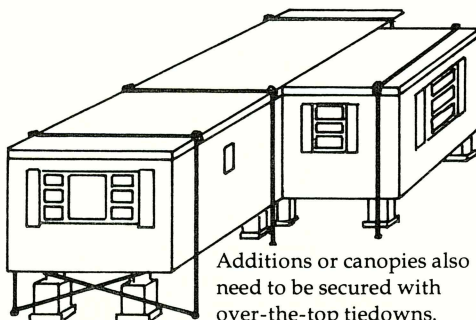


Figure 12

ELEVATING MOBILE HOMES

Mobile homes may be elevated to the "100-year flood" elevation by using dirt fill, post or pilings. In this respect, elevation techniques are similar to those used for residential and commercial structures. For that reason elevation techniques will not be repeated here, and preceding sections of this handbook concerning the elevation of residential and commercial structures should be reviewed.

Mobile Home Evacuation Plans

Regardless of precautionary methods, mobile homes may still be susceptible to severe damage

from flooding. Removal of mobile homes from imminent flooding may be practical in locations subject to a gradual rise in flood waters. More important, however, would be the evacuation of people and readily-removable personal property from mobile home parks. Flood insurance does cover certain removal expenses in these instances. For these reasons, a mobile home evacuation route is encouraged, although not required.

An example of a mobile home evacuation plan is shown in Figure Thirteen. The plan provides at least two escape routes, identifies the equipment and personnel needed for the evacuation, and identifies the staging area.

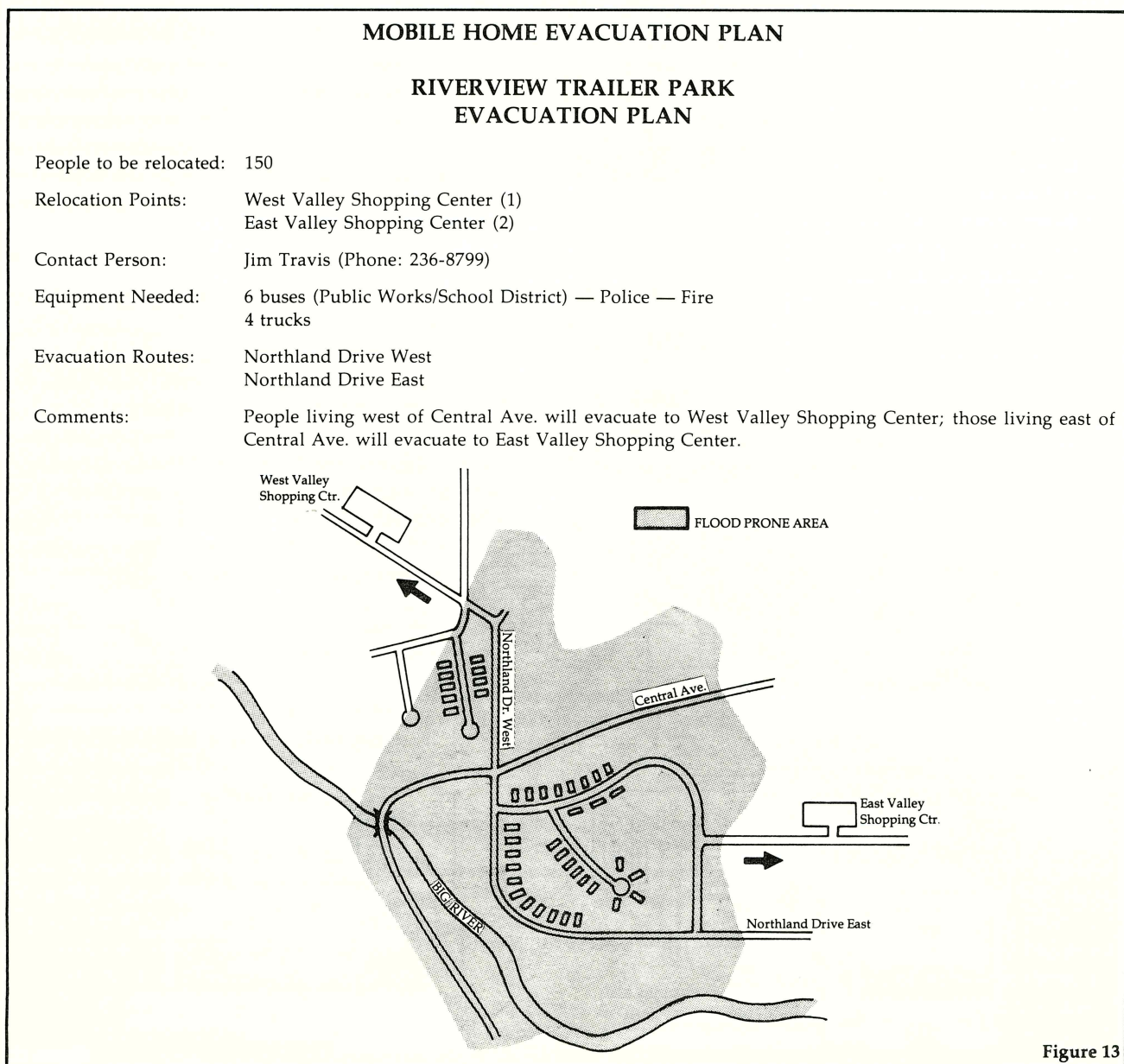


Figure 13

Subdivision Requirements

Subdivision proposals containing 5 or more acres, or consisting of 50 or more lots must meet certain requirements before approval can be given for flood plain management purposes. These requirements are listed below.

PROVIDE BASE FLOOD ELEVATION DATA

It is the responsibility of the developer to produce the Base Flood elevation and delineate the boundary of the flood plain on his subdivision proposal. A grading plan showing the proposed finished elevation of streets and building sites should be included in the proposal. Portions of the grading plan located below the Base Flood elevation may be used for streets, recreation and other uses which will not increase flooding. All structures must be located above the Base Flood elevation.

PROVIDE ADEQUATE DRAINAGE

Building sites should be located at least two feet above the street elevation. Streets should be designed to provide drainage for building sites and prevent ponding in the streets themselves. Stream crossings should be designed to accommodate the Base Flood.

LOCATE PUBLIC UTILITIES AND FACILITIES SO AS TO MINIMIZE FLOOD DAMAGE

Electrical, gas, water and sewer facilities should be protected from flood damage. Electrical facilities should be located above the Base Flood. Gas, water, and sewer systems should be designed to withstand leakage or rupture during flooding.

Requirements for Record-keeping and Certification

GENERAL REQUIREMENTS

It should be apparent from the preceding explanation of Emergency Program ordinance requirements, that records must be maintained of activities regulated by the ordinance. These records include the issuance of permits, certification of compliance with the requirements of the ordinance, and maintenance of maps and other flood hazard information.

MAINTAINING RECORDS OF PERMITS

Records of permits issued for development in flood-prone areas must be maintained by the enforcement officer. A record of permits required

from local, state and federal agencies should also be maintained, where applicable.

OBTAINING CERTIFICATION OF COMPLIANCE WITH THE REQUIREMENTS OF THE ORDINANCE

Developers of structures built after the effective date of the ordinance must certify:

1. The elevation of the first floor level of the structure.
2. The elevation to which a commercial structure is floodproofed, if it has been floodproofed.
3. The elevations contained in the grading plan for subdivision proposals of 5 acres or 50 lots.
4. Specification that new stream crossings will accommodate the Base Flood flow.

Sample development permit and certification forms are included in the last section of this handbook. Items included in record-keeping and certification are illustrated in Figure Fourteen.

IV. THE ANNUAL REPORT

Communities participating in the Emergency Program must file an Annual Report with the Federal Insurance Administration. The report is sent to communities by March and should be returned to the Federal Insurance Administration within three months. An example of an Annual Report is shown in this section. The Annual Report contains information concerning changes to the flood hazard area and program administration. The Federal Insurance Administration requests this information so as to obtain a general idea of changes in the flood-prone areas of the United States, and to determine whether communities are having difficulty in using flood hazard information prepared by the Federal Insurance Administration. Clarification of questions asked in the Annual Report is given in the following pages:

Address Changes — Note any address changes at the top of the form.

Boundary Changes — If your community has annexed areas adjacent to streams, lakes, or other sources of flooding, indicate this on the form and attach a copy of the new community map.

Natural Changes — Only large-scale changes that have obvious effects on flooding need to be reported.

Man-made Changes — Projects built in compliance with the Emergency program ordinance should not be listed. Replacement of culverts, bridges, or other structures which previously contributed to serious flooding should be reported. Construction of non-private dams and levees should be reported. Individual, localized projects such as parking lots, small retention basins, and minor storm drainage improvements should be **excluded**. Large projects designed to decrease flooding should not be reported unless they are 100% funded and 50% completed.

Recent Flooding — Flood damage to residences, businesses and other structures should be reported. Non-structural damage and minor flooding should be omitted.

Amendments to existing laws — If changes in the community's flood plain management ordinance have been made, and the Federal Insurance Administration has not been notified, attach the changes to the Annual Report.

Coordination — Include only those problems which affect your community's flood hazards.

STATISTICS —

- a. **Construction permits** — indicate how many development permits were requested, and how many were granted.
- b. **Variances** — not applicable for the Emergency Program.
- c. **Other variances** — not applicable for the Emergency Program.
- d. **General data** — provide an *estimate* of the population, 1-4 family structures, small business structures, and other structures (schools, churches, public buildings) in the flood hazard area. On the second line provide an *estimate* of the population, 1-4 family structures, small business structures, and other structures in the entire community.

The Chief Executive Officer (Mayor, Chairman of the Board, County Executive, or Presiding Judge) should sign the Annual Report. The last copy should be retained for the community's file, and the remaining copies should be sent to the Federal Insurance Administration's Kansas City Office listed at the top of the form.

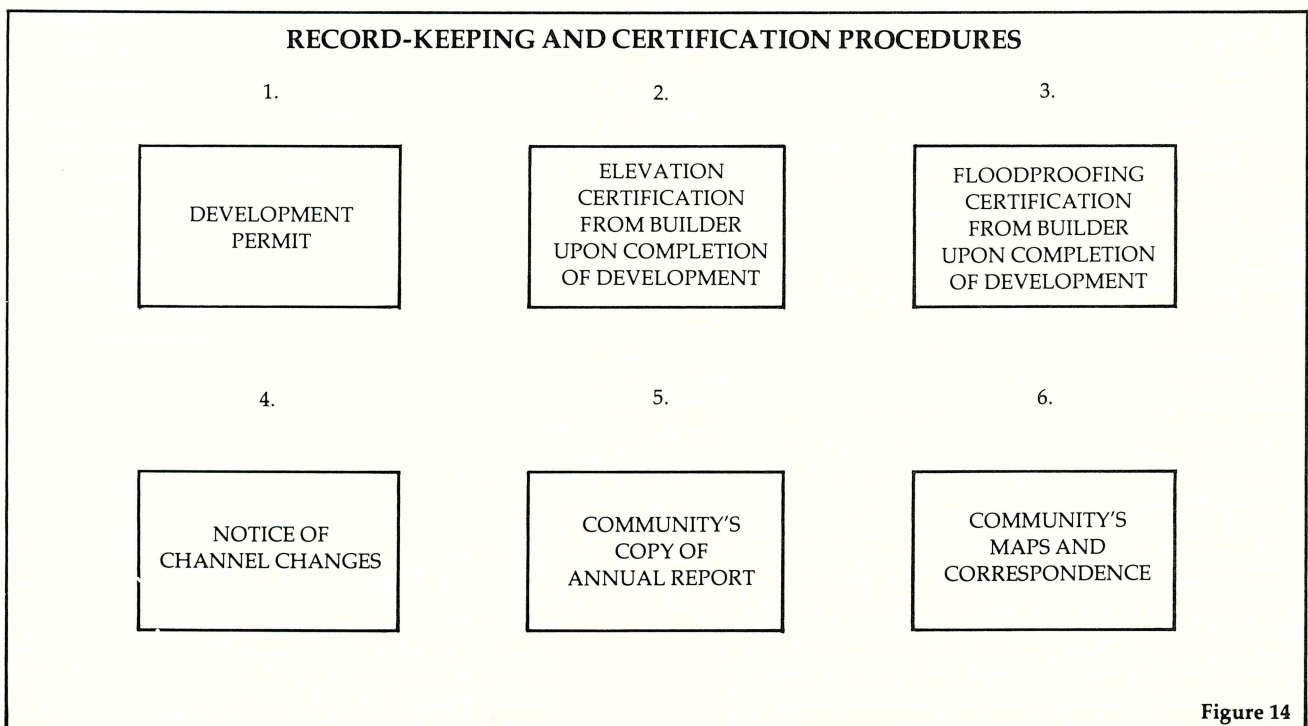


Figure 14

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
FEDERAL INSURANCE ADMINISTRATION
NATIONAL FLOOD INSURANCE PROGRAM

Form Approved
OMB No. 063-R-1546

ANNUAL REPORT -- 1977
RETURN NO LATER THAN 05/15/78

CHAIRMAN, BOARD OF TRUSTEES
EFL-NCR, VILLAGE OF
P.O. BOX 290332
6416 NATURAL BRIDGE
EFL-NCR, MO 63121

RETURN TO:
FEDERAL INSURANCE ADMINISTRATION
(H.U.D.)
FEDERAL OFFICE BUILDING
911 WALNUT STREET
KANSAS CITY, MISSOURI 64106
TELEPHONE NUMBER (816) 374-2161

(Please make the necessary corrections to the above address).

I. PHYSICAL CHANGES TO FLOOD HAZARD AREA

If you answer "yes" to any questions in this section, please attach an FIA Flood Hazard Map or a community map (whichever is applicable) showing the areas affected. In addition, include a brief explanation of the change.

- | | | |
|--|--------------------------|--------------------------|
| a. Boundary Changes. Have there been any changes to your community's corporate limits? | YES | NO |
| b. Natural Changes. Have there been any natural changes in your community's topography which would increase or decrease flooding? (e.g., subsidence, pronounced erosion, seismic effects, sedimentation, or debris build-up). | <input type="checkbox"/> | <input type="checkbox"/> |
| c. Man-made Changes. Have there been any projects or activities which would decrease or increase flooding in your community? (e.g., dams, dikes, levees, bridges, storm sewers, extensive filling, parking lots, retention basins, encroachments). | <input type="checkbox"/> | <input type="checkbox"/> |
| d. Recent Flooding. Has any flooding occurred in your community? (If yes, please provide a brief description of the flood to include the occurrence date, magnitude of the flooding, number and type of structures damaged together with estimates of damage, lives lost and people injured). | <input type="checkbox"/> | <input type="checkbox"/> |

II. PROGRAM ADMINISTRATION

- | | | |
|--|--------------------------|--------------------------|
| a. Amendments to Existing Laws - Have any amendments relating to floods or flood areas been made to your community's codes and/or flood plain management laws? (If yes, please attach a certified copy of the local law). | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Coordination - Has your community had any problems in coordinating its Flood Plain Management Program with adjacent communities? (If yes, please explain the problems on a separate sheet). | <input type="checkbox"/> | <input type="checkbox"/> |
| c. Statistics - The following data will serve as an indication of your community's Flood Plain Management Activities: (Complete each box; if answer is "none," enter zero). | | |

- | | | |
|---|------------------|----------------|
| 1. Construction permits in your flood-prone areas. | Number Requested | Number Granted |
| 2. Variances ^① from FIA's issued 100-year Flood Elevations. These elevations are shown on your community's Flood Insurance Rate Map. (If an asterisk (*) appears following your I.D. number located in your address above, then this question is not applicable to your community. Therefore, enter a "0" (zero) in the space provided). | | |
| 3. Other variances from FIA Flood Plain Management requirements. (Do not include variances from the above question!) | | |

^① Variance means a grant of relief to an applicant by a community from the terms of a Flood Plain Management Regulation.

4. General Data - Complete the following, using the best available figures. (Use your Flood Hazard Map to locate zones).

	Population	1-4 Family Structures	Small Business Structures	All Other Structures
a. All numbered and unnumbered "A" and "V" flood insurance zones.				
b. Entire community (including answers from 4a).				

Name and Title of Chief Executive Officer	Signature	Telephone No. ()	Date
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Reminder: Keep last copy for your records and return 4 copies to the FIA Regional Office indicated above.
HUD 1615 (1-78)

V. THE FLOOD INSURANCE RATE STUDY

All communities identified by the Federal Insurance Administration as having flood hazard areas will eventually be contacted by the Federal Insurance Administration when a flood insurance study is started. It is important that representatives of the community, and interested citizens be present when the initial meeting is held to discuss the flood insurance rate study. The information contained in this section explains the purpose of the study, and the procedure that is used in conducting the study.

As mentioned in the Introduction to this handbook, a community's participation in the National Flood Insurance Program progresses through two stages, namely the Emergency Program and the Regular Program. The Emergency Program begins when a community makes application and adopts resolutions or ordinances for participation in the National Flood Insurance Program. The community is issued a Flood Hazard Boundary Map which delineates the boundary of the 100-year flood without providing the elevation of the flood. The community obtains and uses the best available information as the basis for enforcing the flood elevation requirement for new development.

The flood insurance rate study provides elevations of the 100-year flood and actuarial (actual risk) rates for flood insurance. In addition, stream discharges and profiles are calculated for the 10, 50, 100 and 500-year floods in the flood insurance rate study. Detailed maps prepared from the study replace the Emergency Program Flood Hazard Boundary Map after the study is completed.

Basically, then, the flood insurance rate study provides the detailed information that is required to successfully reduce flood damages in a community. By providing the background data from which actuarial flood insurance rates are based, the study also has the effect of significantly reducing flood insurance rates for new development that is built using the flood elevation information provided in the study. Insurance rates as low as \$.01 per \$100 of coverage on structures becomes effective after the completion of the study.

Study Procedures

Each year, starting in November, the Federal Insurance Administration's Kansas City Office contacts Missouri communities selected for flood insurance rate studies. The mayor or other elected community official is first contacted by letter to inform him that the flood insurance rate study is planned in the near future. Afterwards, contact by telephone is made to arrange a meeting with the community's elected officials and interested citizens to discuss the purpose and procedure of the study. The Federal Insurance Administration contracts with Federal and private engineering firms to perform the flood insurance rate studies. Representatives of the Federal Insurance Administration and the contracting firms will be present at the initial community meeting.

An overview of the National Flood Insurance Program is given at the meeting, and the purpose of the flood insurance rate study is discussed. Flood hazard areas in the community where growth is occurring or likely to occur in the near future are identified, and the study effort is directed toward these areas. The study contractor will need an updated map of the community showing corporate limits, streets and other important information for use in preparing new community flood hazard and flood insurance rate maps.

It is important to have present at the initial community meeting the community's engineer, public works director or engineering consultant, or for these people to be available for consultation with the representatives of the Federal Insurance Administration and the study contractor. The community engineer or other technical representative will be asked information concerning community mapping, elevation reference marks, and other studies that have been prepared for the community. All available information will be used by the study contractor with the objective of preparing the most accurate flood insurance rate study possible.

The flood insurance rate study requires two years for completion. During the first year the study contractor visits the community to survey streams and collect additional data. Aerial and ground surveys are usually made of all streams selected for detailed study in the initial meeting with the community. Upon completion of the preliminary report, usually after eighteen months, representatives of the Federal Insurance Administration and the study contractor will meet with community officials and interested

citizens to discuss the preliminary results of the study. If changes in the study and preliminary maps are needed as a result of the second community consultation meeting, these changes are made to the preliminary copy of the study and maps. Approximately three months later, representatives of the Federal Insurance Administration and the study contractor again meet with community officials and interested citizens to discuss the final results of the study.

Upon completion of the flood insurance rate study, a formal appeals period is established during which time property owners or the community government may appeal the 100-year flood elevations computed for the study. Notice of the 100-year flood elevations is published in the local community newspaper at the beginning of the appeals period. After the appeals period has ended, the community has a period of six months in which to enact a new ordinance that would qualify the community for continued participation in the National Flood Insurance Program's Regular phase. The new ordinance would specify that the 100-year flood elevations computed in the flood insurance study would be used as the basis for elevating and floodproofing new development, and otherwise protecting property from flood hazards. When the new ordinance is adopted the community becomes eligible for participation in the Regular Program.

Community officials are often concerned about the cost to the community for performing the flood insurance rate study. Communities are requested to make available any information which will improve the quality of the study, such as large-scale community maps, copies of other studies made of the community, and any other sources of information which would prove helpful in preparing the flood insurance rate study. There is, however, no cost to the community for the study itself.

VI. OTHER CONSIDERATIONS

The foregoing information explains the minimum requirements for participation in the Emergency Phase of the National Flood Insurance Program. There are other considerations that communities may want to pursue to protect new development from flood hazards and reduce flood damage to existing homes and businesses. Disaster plans and technical assistance are two such considerations that communities may wish to make.

Disaster Plans

The Emergency Program ordinance specifies steps that communities can take to reduce future flood hazards. The ordinance does not, however, specify what actions a community may take to reduce flood losses, especially the loss of life, at the instant that flooding occurs. Disaster plans can be made *before* flooding occurs, thereby preparing community leaders and the resources of the community for the emergency. The Disaster Planning and Operations Office of the State of Missouri assists communities in preparing disaster plans, and interested parties should contact that office for information. The address and phone number of the Disaster Planning and Operations Office is listed in the Appendix of this Handbook.

Technical Assistance

Sources of assistance in obtaining flood information were mentioned in previous sections of this handbook. Communities may contact the Disaster Planning and Operations Office or the Regional Office of the Federal Insurance Administration for assistance with any aspect of the Emergency Program. The addresses and phone numbers of the Disaster Planning and Operations Office and Regional Office of the Federal Insurance Administration are listed in the Appendix to this Handbook.



A P P E N D I X

Information and Materials Available From The Federal Insurance Administration

Regulations & Legislation

001 Amendments — Housing and Community Development Act of 1977

1. Changes loan regulations in areas not participating in the National Flood Insurance Program.
2. Increases limits of coverage under National Flood Insurance Program.
3. Expands authority for purchase of flood damaged properties. (No funding available yet)
4. Authorizes loans for elevation of damaged property. (No funding available yet)

002 Executive Order 11988 dated 5-24-77

This order directs each Federal agency to provide leadership and take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by flood plains in carrying out its responsibilities. It also prescribes procedures to implement the policies and requirements of this Order.

003 Outline of Executive Order 11988

004 Flood Plain Management Guidelines for Implementing E. O. 11988

This notice incorporates the guidelines for Implementing Executive Order 11988-Floodplain Management adopted by the Water Resources Council on January 25, 1978 to assist Federal agencies in preparation of their regulations and procedures for implementing the Order.

005 Implementation Provisions dated 7-24-74

Part 1916 establishes a procedure through which local officials are to be consulted regarding flood studies for their communities.

Part 1917 establishes procedure for administrative and judicial review of proposed flood elevation determinations.

Part 1918 establishes procedures for administrative hearings on appeals of proposed flood elevation determinations.

006 Mandatory Purchase Requirements dated 2-17-78 (Federal Register)

The guidelines provide guidance to the many Federal agencies and private lending institutions subject to the flood insurance purchase requirements of Section 102 of the Federal Disaster Protection Act of 1973 as amended by the Housing and Community Development Act of 1977.

007 The Act

Flood Disaster Protection Act of 1973, Public Law 93-234

Housing and Urban Development Act of 1969, Public Law 91-152

Housing and Urban Development Act of 1968, Public Law 90-448.

008 National Flood Insurance Program Regulations dated 10-26-76

Ordinances & Resolutions

- 101 Ordinance No. 1** — This is a sample ordinance designed to meet the minimum requirements for participating in the emergency phase of the National Flood Insurance Program.

- 102 Ordinance No. 2A** — This is an amendment to an existing zoning ordinance for entrance into the regular phase of the NFIP. This sample creates two overlaying districts: a floodway and a floodway fringe, in which a development permit and review procedures are established for development only in the Special Flood Hazard Area. Existing zoning is not changed. Specific performance standards are applied to each district for development. Applicable *only in* communities exercising zoning.
- 103 Ordinance No. 2A(c)** — This is an amendment to an existing zoning ordinance for entrance into the regular phase of the NFIP. This sample creates one overlaying district: a floodway fringe, in which a development only in the Special Flood Hazard Areas. Existing zoning is not changed. Specific performance standards are applied to the district for development. Applicable *only in* communities that exercise zoning.
- 104 Ordinance No. 3** — This is a “general purpose” flood plain management ordinance which establishes a development permit and review procedures for development only in the Special Flood Hazard Area. A regulatory floodway and floodway fringe districts is established. This ordinance pertains only to the regular phase of the NFIP. Applicable in communities where zoning is exercised and where it is not.
- 105 Resolution** — This is a sample of a resolution which meets all the minimum essential requirements under 1910.3(a) of the program.
- 106 Guide for Ordinance Development — Community Assistance Series No. 1(b)**
The purpose of this booklet is to assist local officials in preparing flood plain management measures that satisfy the emergency program’s minimum requirements that are consistent with community needs and objectives. It consists of a sample ordinance which appears on the left side of the page and explanatory narrative.
- 107 Guide for Ordinance Development — Community Assistance Series No. 1(c)**
The purpose of this booklet is to assist local officials in preparing flood plain management measures that satisfy the regular program’s minimum requirements, with a designated regulatory floodway, that are consistent with community needs and objectives. It consists of a sample ordinance which appears on the left side of the page and an explanatory narrative.
- 108 Guide for Ordinance Development — Community Assistance Series No. 1(d)**
The purpose of this booklet is to assist local officials in preparing flood plain management measures that satisfy the regular program’s minimum requirements, with a designated regulatory floodway, that are consistent with community needs and objectives. It consists of a sample ordinance which appears on the left side of the page and an explanatory narrative.

Community Procedures/Applications

201 Letter of Map Amendment

This is to advise of Federal Insurance Administration policy concerning requests for a determination as to whether or not a land area or a structure is in a Special Flood Hazard Area. The purpose of this policy is to set forth the criteria that must be satisfied before a “Letter of Map Amendment” can be issued.

202 “Appeals to Flood Plain Maps”

Describes basis, methods and type of appeals which may be considered.

203 Flood Plain Development Permit Application (Sample)

States the minimum requirements for entering the emergency program and making flood insurance available to citizens of the community.

204 How to Enter the National Flood Insurance Program

States the minimum requirements for entering the emergency program and making flood insurance available to citizens of the community.

207 Elevation/Floodproofing Certification Forms

208 Sample forms for requiring elevation/floodproofing certification in Zones AO and AF, and Zones A1-30 and AH.

209 Elevation Certification

Sample form for requiring elevation certification.

210 Guide for Consultation — Flood Insurance Studies

Guide for consultation and coordination of flood insurance studies with community officials.

Insurance

301 National Flood Insurance Program — Flood Insurance Manual

This manual provides general rules and definitions, procedures for completing necessary application forms, rate tables and other rating criteria.

302 Insurance Crisis in Urban America

This is a Federal Insurance Administration study of State Fair Access to Insurance Requirements plans and the effect their administration has had "on the availability and affordability of insurance".

303 Full Insurance Availability dated September 14, 1974

This FIA report recommends a process by which private insurers can make property and casualty insurance more readily available to the public at reasonable cost.

304 Claims Handbook for Adjusters dated April, 1978

This handbook is intended as a guide for adjusters in the handling of claims under the standard flood insurance policy. It should not be considered all-inclusive.

Technical Manuals and Information

501 Flood Prone Areas and Land Use Planning — Source: United States Geological Survey

This USGS report examines the problem of flooding in the San Francisco Bay region. It describes the preparation and use of various types of flood maps and flood information reports, lists sources of information on flooding and flood plains, discusses flood loss prevention and reduction measures, and discusses the role of comprehensive planning in flood plain management.

502 Elevated Residential Structures — Source: Federal Insurance Administration

This FIA manual provides background information on the National Flood Insurance Program, and the hazards associated with building in the flood plain, a review of existing alternative approaches for housing built on raised foundations, recommended performance criteria for the construction of foundation systems in flood hazard areas and some indications of design solutions.

503 Construction of Basements Manual — Source: Federal Insurance Administration

This FIA manual provides practical and specific design options, within the current state of the art, to meet the requirements of the NFIP for new homes with basements.

504 How to Read a Flood Hazard Boundary Map (FHBM)

This is a guide to aid in understanding the Flood Hazard Boundary Map.

505 How to Read a Flood Insurance Rate Map (FIRM)

This brochure is a guide to help identify and understand key features of the Flood Insurance Rate Map.

506 Statutory Land use Control Enabling Authority of the Fifty States

This report summarizes and analyzes statutes authorizing local units of government and state agencies to adopt zoning regulations, subdivision controls, building codes, and special flood hazard regulations. Emphasis throughout is upon land use control legislation authorizing regulation of flood prone areas. The report also examines case law interpreting the general scope of enabling authority and lists annotated flood plain regulation cases.

507 A Perspective on Flood Plain Regulations for Flood Plain Management

This Corps of Engineers pamphlet describes the current state-of-the-art of flood plain regulations.

509 Economic Justification of Floodproofing: Analysis of a New Commercial Structure

Private consultants prepared this for the U.S. Department of Housing and Urban Development Office of Policy Development and Research. This report shows that floodproofing can be economically justified from at least three separate perspectives: reduction in insurance premiums, reduction in flood damage potential, and reduction in business interruption costs.

510 Introduction to Floodproofing

Prepared by the Center for Urban Studies, University of Chicago. This publication on structural floodproofing is intended to acquaint public officials, building owners and professionals with essential principles and to outline and illustrate a number of simple but effective measures for reducing flood damage.

Promotional/Educational

601 Sources of Information for the National Flood Insurance Program.

602 “High Rock” — History of flood insurance in the United States.

603 Q & A — FIA booklet of 59 questions and answers about the National Flood Insurance Program.

604 Q & A, Flood Plain Management — FIA booklet of questions and answers specifically dealing with flood plain management.

605 “Common Misconceptions” — Common misconceptions about the National Flood Insurance Program.

606 Actuarial Rates — One page handout explaining actuarial rates. Two examples provided.

607 The Local Government’s Responsibility — General explanation of the local government’s responsibilities.

608 **EDS — Insurance Agents' Manual**

609 **"Planning for Floods"** — 16mm color film, 28 minutes. Examples of flood plain management and flooding to case studies in the Rapid City, South Dakota and St. Louis, Missouri areas.

610 **The Lenders Responsibility** — General explanation of the lender's responsibility in regard to the NFIP.

611 **Crime Insurance Q & A** — HUD booklet of 20 questions and answers about the Federal Crime Insurance Program.

Lender's Forms

701 **"Suggested Lender's Notice to Borrower"** — This is a notice to a borrower, with property located in a Special Flood Hazard Area, as to the availability of federal disaster assistance in the event of a flood.

702 **"Certification of Proof of Purchase of Flood Insurance"** — This form certifies that a Flood Insurance Policy has been applied for and the premium remitted to the servicing agent of the NFIP.

703 **"Certification of Redetermination of a Property's Location Relative to Special Flood Hazard Areas"** — This form is used when the latest (Flood Hazard Boundary Map/Flood Insurance Rate Map) now in effect shows the property to no longer be in a special flood hazard area as shown on the previous map.

704 **"Agreement to Furnish Continuous Flood Insurance"** — Borrower acknowledges that their property is located in a HUD identified flood zone and agrees to keep flood insurance in force during the full term of the loan contract.

Additional Publications

211 **"Entering the Regular Program"** — This publication describes the Federal Insurance Administration's procedures and the community's rights and responsibilities as they prepare to enter the permanent, "Regular Program" phase of the National Flood Insurance Program.

305 **"Map Order Forms"** — This form may be used to order Flood Hazard Boundary Maps and Flood Insurance Rate Maps from EDS.

511 **National Flood Insurance Program Handbook for Missouri Communities Volume 1: Emergency Program.**

**Request for Publications
Region VII Order Form
Publications & Educational Materials**

**Number of
Copies** **Inventory
Number**

Regulation & Legislation

	001	Amendments — Housing and Community Development Act of 1977
	002	Executive Order 11988
	003	Outline of Executive Order 11988
	*004	Flood Plain Management Guidelines for Implementing E.O. 11988
	005	Implementation Provisions (7-24-74)
	006	Mandatory Purchase Requirements (2-17-78)
	007	Acts
	008	National Flood Insurance Program Regulations (10-26-76)

Ordinances & Resolutions

State

	101		Ordinance No. 1
	102		Ordinance No. 2A
	103		Ordinance No. 2A(c)
	104		Ordinance No. 3
	105		Resolution A
	106		Guide for Ordinance Development No. 1(b)
	107		Guide for Ordinance Development No. 1(c)
	108		Guide for Ordinance Development No. 1(d)

Community Procedures/Applications

- _____ 201 Letter of Map Amendment
- _____ 202 "Appeals to Flood Plain Maps"
- _____ 203 "Flood Plain Development Permit Applications"
- _____ 204 "How to Enter the National Flood Insurance Program"
- _____ 205 Application Forms National Flood Insurance Program
- _____ 206 "How to Order Maps"
- _____ 207 Elevation/Floodproofing Certification Form — AO & AF Zones
- _____ 208 Elevation/Floodproofing Certification Form — A1-30 & AH Zones
- _____ 209 Certification of Elevation
- _____ 210 Guide for Consultation Flood Insurance Studies
- _____ 211 "Entering the Regular Program"

Insurance

- _____ 301 NFIP Flood Insurance Manual
- _____ *302 "Insurance Crisis in Urban America"
- _____ *303 "Full Insurance Availability"
- _____ 304 Claims Handbook for Adjusters dated April 1, 1978
- _____ 305 Map order forms

Mitigation

- _____ "Review Guidelines to Assist in Mitigating Flood Losses"

Technical Manuals & Information

_____	501	Flood Prone Areas and Land Use Planning
_____	*502	Elevated Residential Structures
_____	*503	Construction of Basements Manual
_____	504	How to Read a Flood Hazard Boundary Map
_____	505	How to Read a Flood Insurance Rate Map
_____	*506	Statutory Land Use Control Enabling Authority in 50 States
_____	*507	Individual Copies of Community Flood Insurance Studies
_____	*508	A Perspective on Flood Plain Regulations for Flood Plain Management
_____	*509	"Economic Justification of Floodproofing: Analysis of a New Commercial Structure"
_____	510	Introduction to Floodproofing
_____	511	National Flood Insurance Program Handbook for Missouri Communities Volume 1: Emergency Program

Promotional/Educational

_____	601	"Sources of Information for the National Flood Insurance Program"
_____	602	"High Rock"
_____	603	Q's & A's — General in English or Spanish
_____	604	Flood Plain Management Q's & A's
_____	605	"Common Misconceptions"
_____	606	"Actuarial Rates"
_____	607	"The Local Government's Responsibility"
_____	608	EDS
_____	609	"Planning for Floods" — Film (on loan)
_____	610	"The Lenders Responsibility
_____	611	Crime Insurance Q's & A's

*Limit one copy.

Send to: Federal Insurance and Hazard Mitigation
FEMA
911 Walnut Street
Kansas City, Missouri 64106

Sources of Information for Flood Insurance

Questions concerning the availability of flood insurance, insurance rates, and other general insurance issues should be referred to local insurance agents, or . . .

Contact the **National Flood Insurance Program**

**P.O. Box 34294
Bethesda, Maryland 20034
(800) 638-6620**

Flood losses should be reported to the insurance agent who wrote the insurance policy.

EDS Federal, the servicing agent for the National Flood Insurance Program, maintains a regional office at:

**EDS Federal Corporation
Executive West
Suite 104
6700 Squibb Road
Mission, Kansas 66202
(913) 262-6006**

State and Federal Contacts

Federal Insurance and Hazard Mitigation, FEMA administers the National Flood Insurance Program. The Regional Office, located in Kansas City, Missouri may be contacted at:

**Federal Insurance and Hazard Mitigation
FEMA
911 Walnut St.
Room 210
Kansas City, Missouri 64106**

Phone: (816) 374-2161

The State of Missouri Coordinator for the National Flood Insurance Program is the Disaster Planning and Operations Office located in Jefferson City, Missouri. The State Coordinator may be contacted at:

**State Flood Coordinator
Disaster Planning & Operations Office
P.O. Box 116
Jefferson City, Missouri 65102**

Phone: (314) 751-2321

Sources of Information Used in this Handbook

The following sources were used in developing various parts of this handbook:

1. **Elevated Residential Structures, Reducing Flood Damage Through Building Design: A Guide Manual**, U.S. Department of Housing and Urban Development, (1976).
2. **Floodplain Regulation Workshop**, Illinois Department of Transportation, Division of Water Resources, (1978).
3. **Floodproofing Regulations**, Office of the Chief of Engineers, U.S. Army, (June, 1972).
4. **Introduction to Floodproofing**, Center for Urban Studies, The University of Chicago, (April, 1967).
5. **On-Site Sewage Disposal in Flood Plain Areas, Technical Report 5**, Minnesota Department of Natural Resources, Division of Waters, Soils and Minerals, (December, 1974).
6. **Reducing Flood Damage, a Manual for Local Government Officials**, Prepared by the Governor's Task Force on Flood Control, Springfield, Illinois, (June, 1975).
7. Various reports, policy statements and guidelines published by the Federal Insurance Administration, Department of Housing and Urban Development, Washington, D.C.

Ordering Flood Hazard Boundary Maps

Flood Hazard Boundary Maps may be ordered from:

**National Flood Insurance Program
P.O. Box 34294
Bethesda, Maryland 20034
(800) 638-6620 (Toll Free)**

When ordering from this source you will automatically be placed on a mailing list and you will receive updated maps as they are produced.

Emergency map requests may be requested from:

**Federal Insurance and Hazard Mitigation
FEMA
Room 210
911 Walnut
Kansas City, Missouri 64106
(816) 374-2161**

**State Flood Coordinator
Disaster Planning & Operations Office
P.O. Box 116
Jefferson City, Missouri 65102
(314) 751-2321**

When ordering from these sources, you will not be placed on a mailing list and you will not receive updated maps as they are produced.

Flood Plain Development Permit Application

Application No. _____ Date _____

Street Address of Property: _____

Type of Development:

Residential _____ Commercial _____ Industrial _____

Dirt Fill _____ Dredging _____ Excavation _____

Other (specify) _____

Specifications:

Elevation of First Floor Level _____ ft. M.S.L.

Elevation of Basement Floor _____ ft. M.S.L.

Elevation to which building is to be floodproofed watertight
_____ ft. M.S.L.

Name of Individual Responsible for Meeting Construction Standards:

_____ Address _____

Property Located in an Identified Flood Hazard Area? _____

Elevation of 100-year flood (if known) _____ M.S.L.

Signature of Owner _____

Approved By _____

Date _____

Certification: This is to certify that the start of construction for the above development was
on _____, 19 ____.

(Builder)

Elevation/Floodproofing Certification Form

The elevation and floodproofing sections of this form must be completed by either a registered professional engineer or architect. The elevation section may also be completed by a licensed land surveyor.

Elevation Certification

I certify that the structure at the property location described below is designed so that the lowest finished floor is at an elevation of _____ feet NGVD (mean sea level).

My certification is conditional upon the actual construction of the building in strict compliance with the plans presented to me. If there will be a floor beneath the lowest finished floor, please describe and give elevation of same _____

_____.

Floodproofing Certification

I certify that the structure, together with the proposed utility and sanitary facilities, are designed so that the structure will be water-tight to an elevation of _____ NGVD (mean sea level), with walls substantially impermeable to the passage of water and structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy.

My certification is conditional upon the actual construction of the building in strict conformance with the plans presented to me.

In the event of flooding, will this degree of floodproofing be achieved with human intervention? _____ Will the structure be occupied as a residence? _____

Signature _____ Date _____

Name & Title _____

Address _____

Affix Seal:

